



Louisiana Coastal Protection and Restoration (LACPR)



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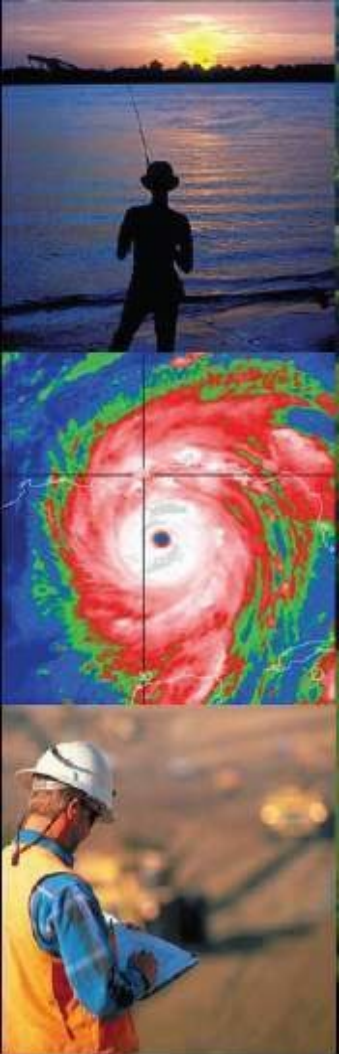
Presentation to

**Netherlands Ministry of Transportation,
Public Works, and Water Management
(Rijkswaterstaat)**

**LACPR US-Dutch Collaboration
The Hague, The Netherlands
10-11 October 2006**

and

**Environmental Commission
of the
Permanent International Association
of Navigation Congresses
Burnham-on-Crouch, UK
25-27 October 2006**



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Purpose of Briefing



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- Present new approach to Risk-Informed Planning (RIP)
- Solicit feedback on:
 - RIP Process
 - Objectives and Metrics
 - Beyond analysis:
 - Making difficult decision tradeoffs
 - Adaptive management



Congressional Direction



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- Comprehensive hurricane protection analysis and design
- Full range of flood control, coastal restoration, and hurricane protection measures
- Storm surge equivalent to a “Category 5” hurricane
- Exclusive of normal policy considerations
- Preliminary Technical Report within 6 months
- Final technical report within 24 months
- Reports on component areas for authorization as soon as practicable
- Close coordination with the State of Louisiana

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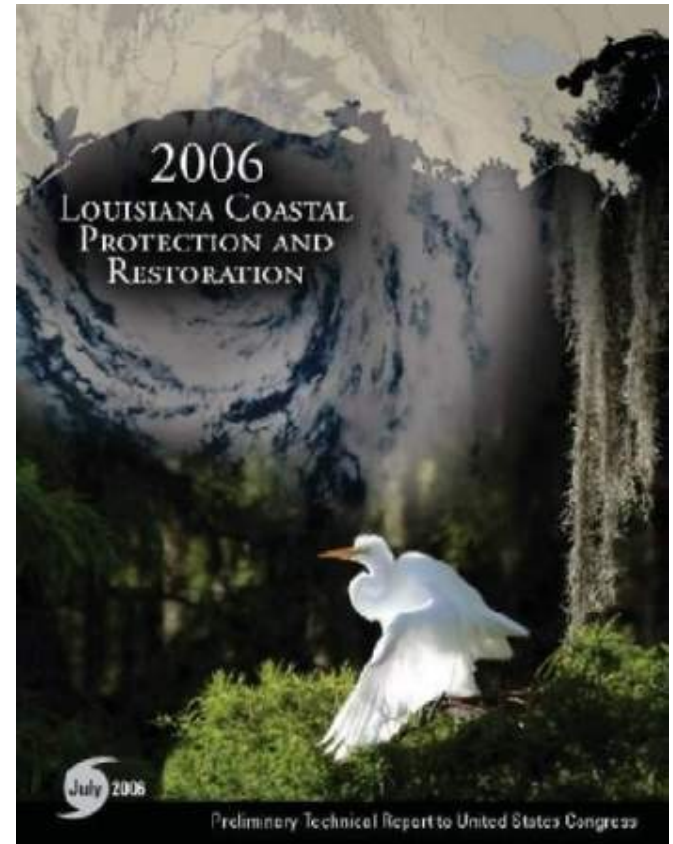


Preliminary Technical Report



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- Report completed in July 2006
- Characterizes hurricane threat and engineering design challenges
- Multiple lines of defense strategy
 - Coastal restoration/protection
 - Structural measures
 - Non-structural features
- Describes need for using risk reduction decision framework
- Describes plan to produce Final Technical Report



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Importance of Coastal Louisiana to the Nation



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- Louisiana is a “working coast”
 - Strategic energy production and delivery corridor
 - Waterborne commerce gateway to the world
 - Vibrant commercial fisheries production grounds
 - Coastal ecosystem with diverse fish and wildlife
- Coastal restoration is integral to hurricane protection of Louisiana’s “working coast”
- Unaddressed risk to coastal Louisiana equates to risk of disrupted goods and services to Nation

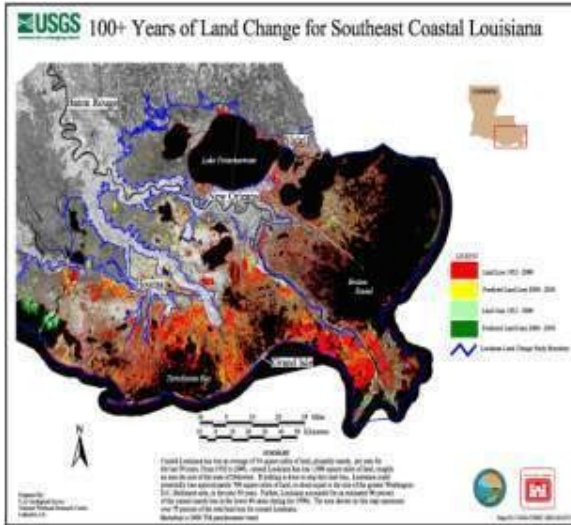




Planning and Design Challenges



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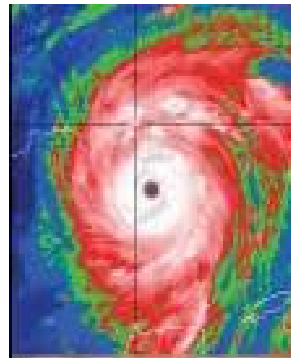
Coastal landscape change



Interconnecte
d systems



Pointe A La Hache River levee
Community recovery
timelines



Battling
nature's most
powerful
storms



Difficult
engineering
conditions



Innovative technologies

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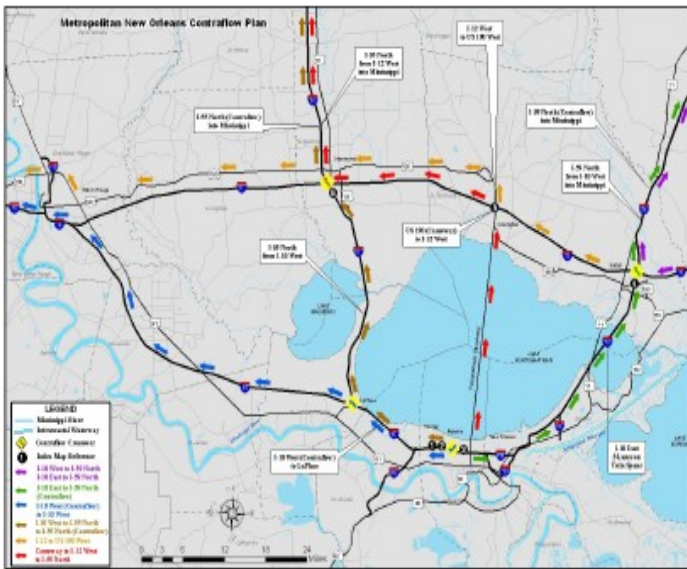
Flood and Storm Damage Risk Reduction Strategies



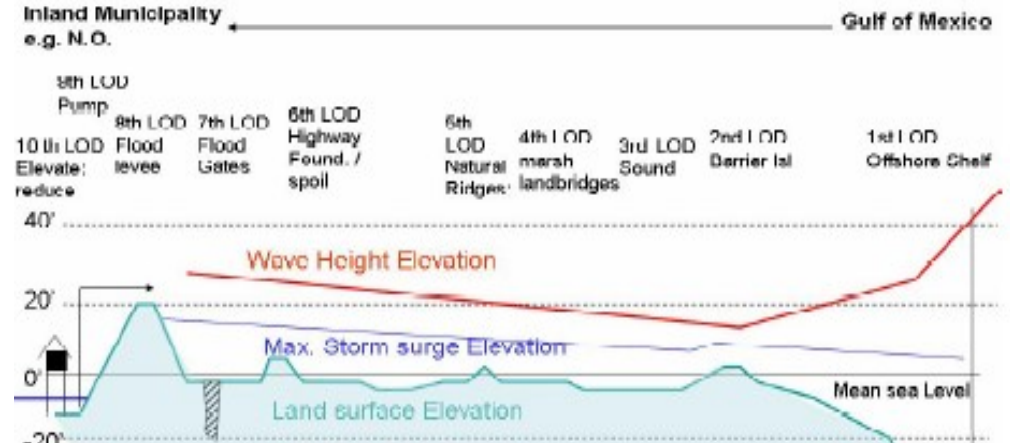
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Community recovery and redevelopment plans



Evacuation plans



Coastal lines of defense



Structural storm surge barriers

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Coordinated Planning Efforts



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- State of Louisiana
 - Coastal Protection and Restoration Authority Master Plan
 - Louisiana Recovery Authority Community Redevelopment Planning
- Multi-discipline – broad organizational teams
 - State and Federal agencies
 - Academia
 - Dutch Rijkswaterstaat, other nations worldwide
- Strong public involvement
 - Workshops
 - Public scoping
 - Stakeholder forums
- Quality Reviews
 - Independent Technical Review
 - External Peer Review

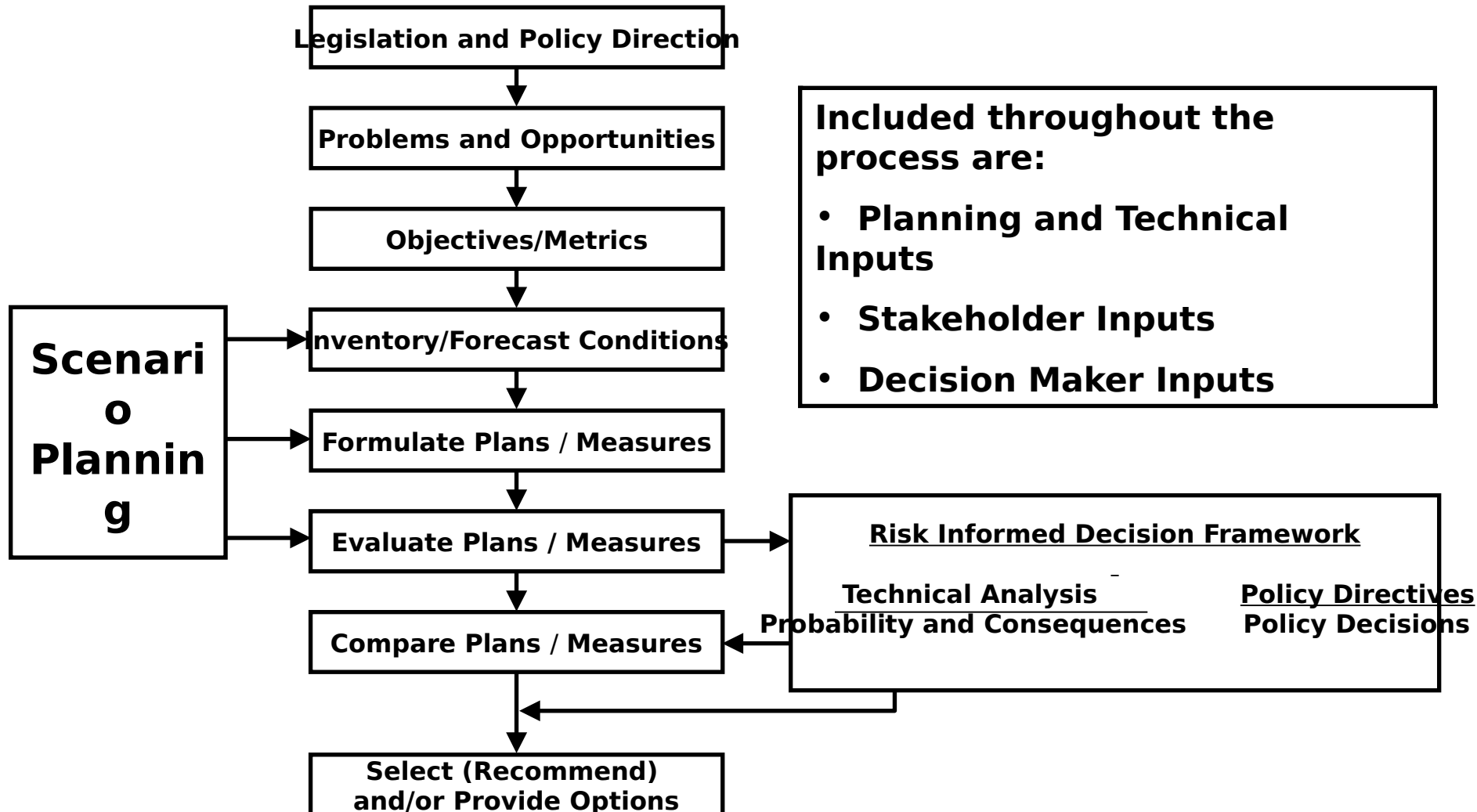
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Risk-Informed Planning



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Federal Objectives and Metrics



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Objective	Metric	Units
Reduce risk to public health and safety from catastrophic storm inundation	Population at risk Evacuation success Reduction of residual risk	% exposed % evacuated
Reduce damages from catastrophic storm inundation	Single Event Storm damages reduced Other economic impacts Reduction of residual risk Strategic significance	\$ Y/N
Promote a sustainable ecosystem	Resiliency / sustainability	High, medium, low
Restore / sustain diverse fish and wildlife habitats	Habitat suitability Coastal land gain/loss	HSUs Acres by type
Sustain working coast heritage, history, and cultures	Proportion of historic sites protected OSE factors	%

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Scenario Planning



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- Major uncertainty “drivers”
 - Local sea-level rise and land subsidence
 - Redevelopment
 - Rates
 - Residential/Commercial/Industrial
 - Local zoning and flood plain management
 - Relative storm frequency and intensity
- Multiple “futures” based on all combinations
- Assess plans against all “futures”
- No probabilities assigned



Quantitative Uncertainties



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- Variables to which probability can be assigned
- Variables having reasonably well-established uncertainty bands
- Key examples
 - Property values
 - Elevation
 - Inundation frequencies and stage
 - Rates of land loss
 - Population at risk



Sensitivity Analysis



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- Variables with moderately to weakly established uncertainty bands
- Examples
 - Sediment availability
 - Evacuation effectiveness
 - Project performance
 - Large scale coastal restoration
 - Structural measures
 - Non-structural measures



Planning Units*



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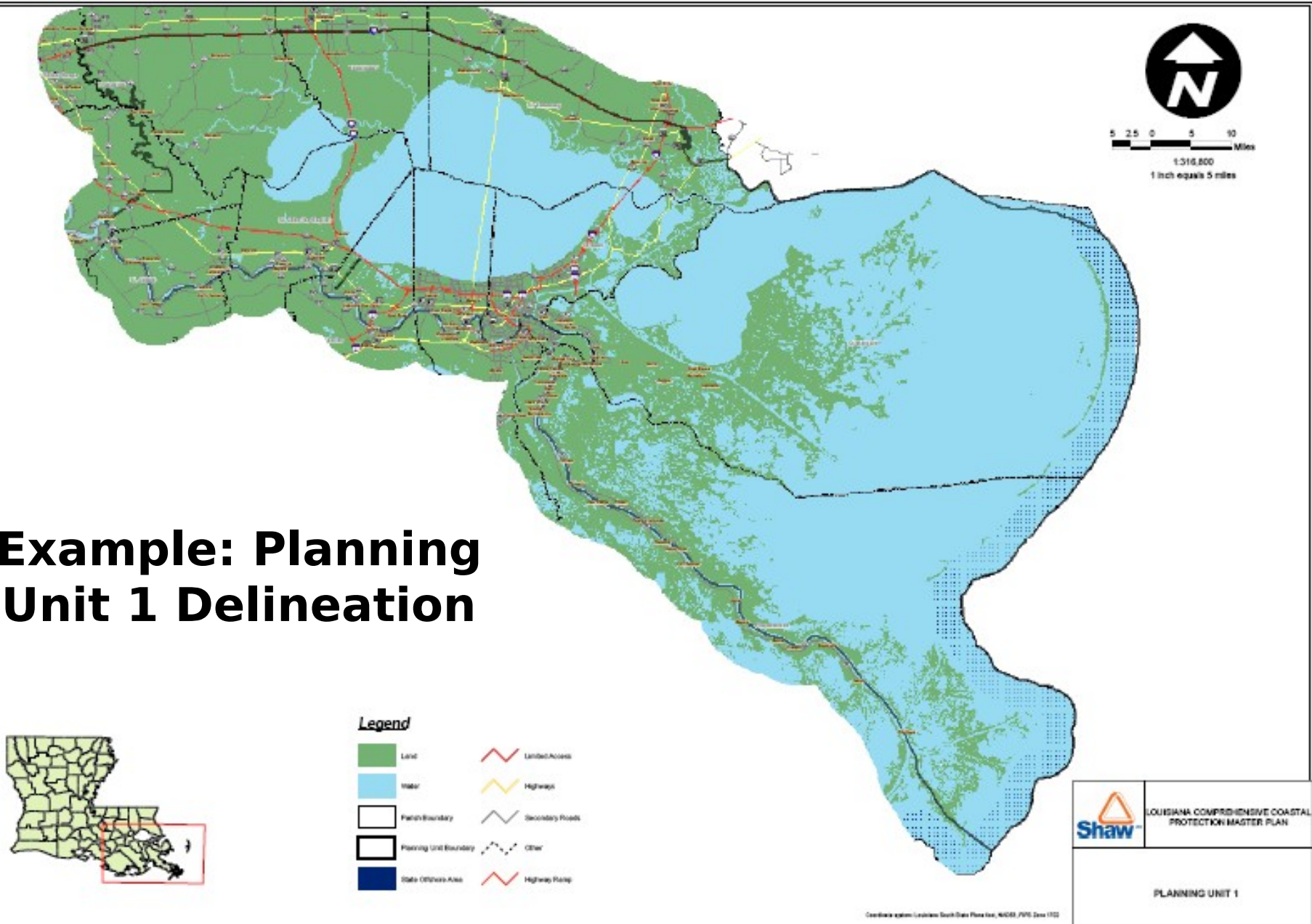
Geographic Planning Units



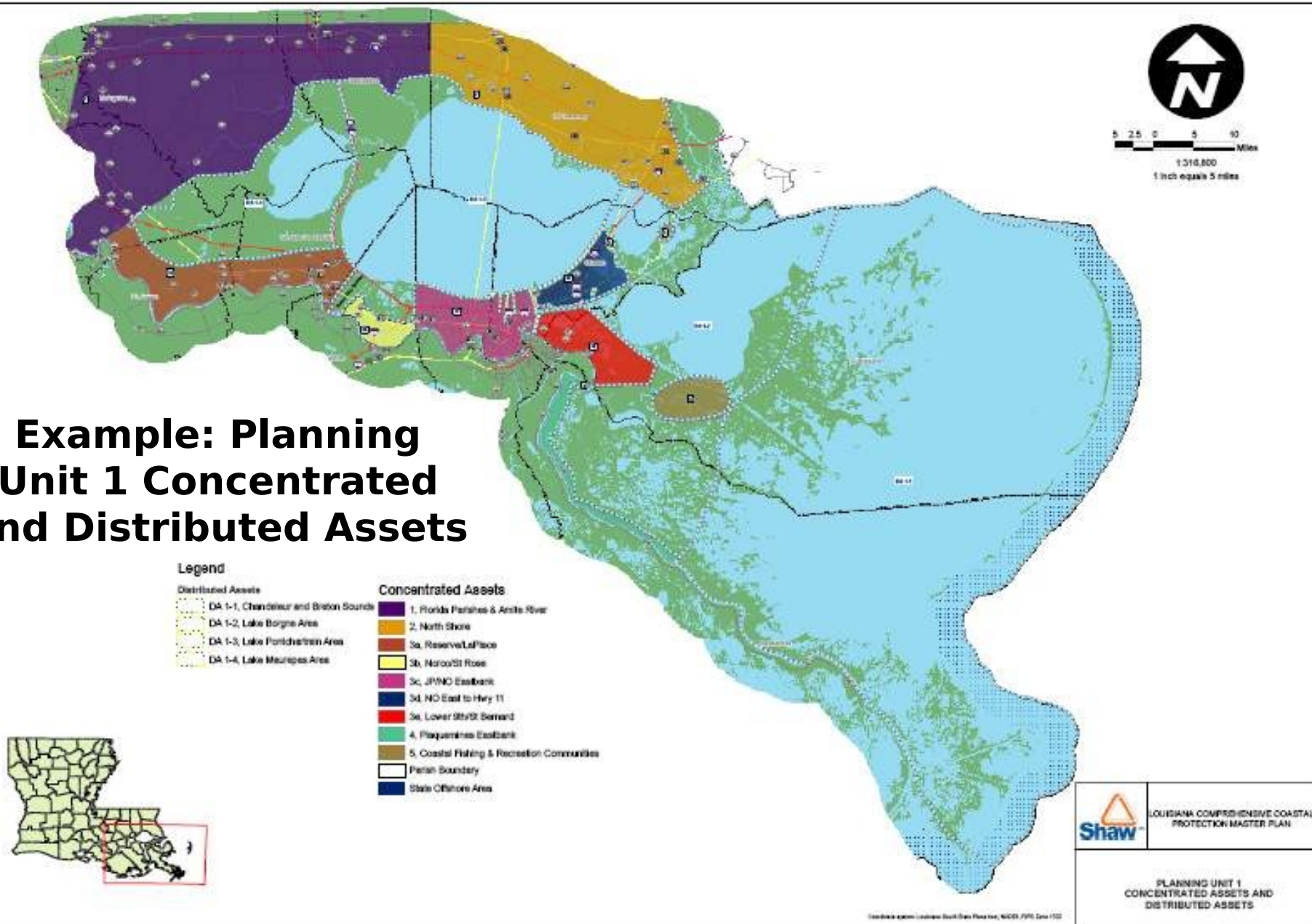
* Further divided into sub-units for better resolution as investigation progresses

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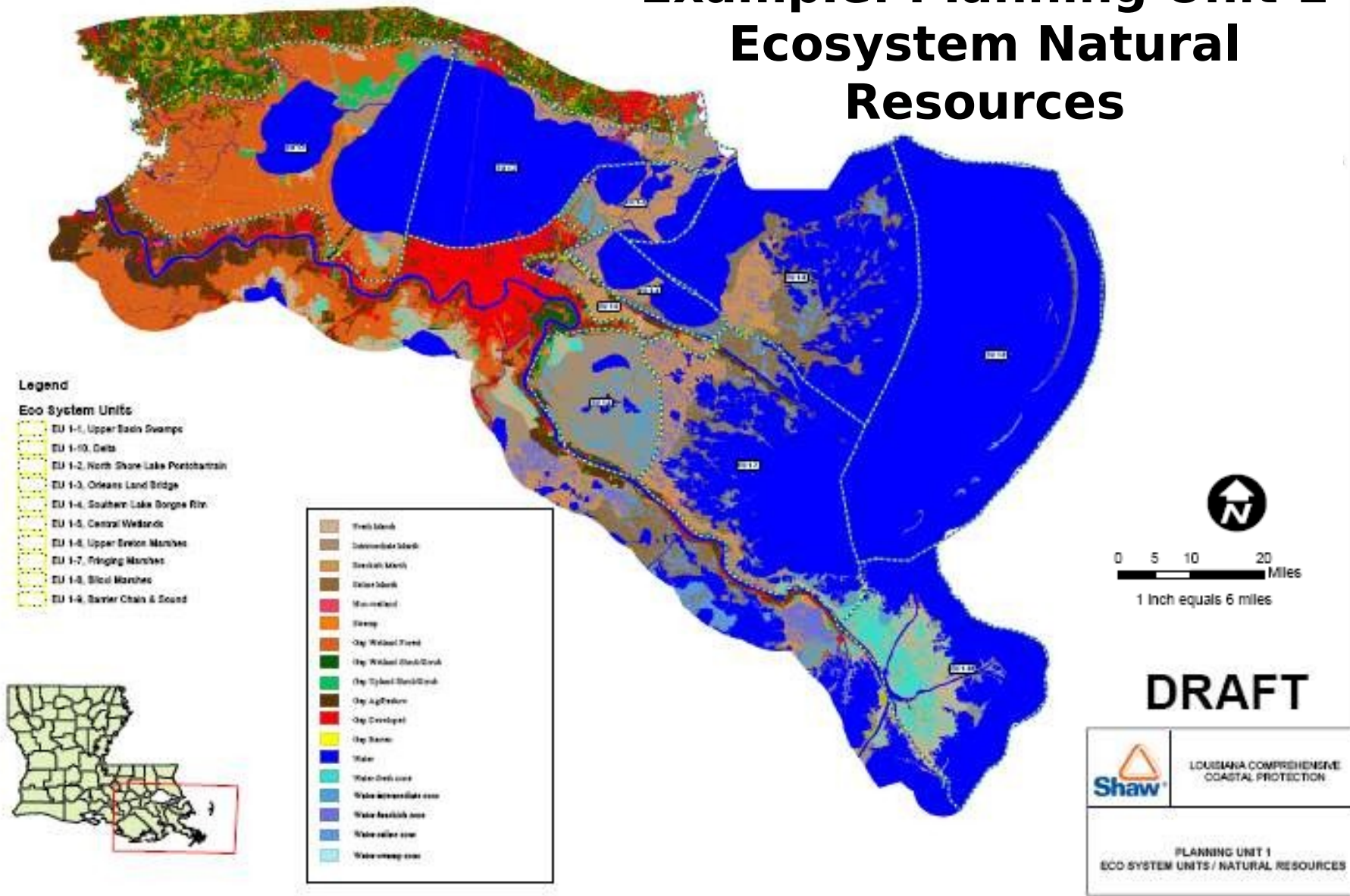
Example: Planning Unit 1 Delineation



Example: Planning Unit 1 Concentrated and Distributed Assets



Example: Planning Unit 1 Ecosystem Natural Resources







Evaluation of Plans / Measures



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Scenario Combination X, Planning Unit Y

Plan	Metric 1	Metric 2	Metric 3	Metric n
w/o project	Performance against metric	Performance against metric	Performance against metric	Performance against metric
Alt. 1	Performance against metric	Performance against metric	Performance against	Performance against metric
Alt. 2	Performance against metric	Performance against metric	Performance against	Performance against metric
Alt. 3	Performance against metric	Performance against metric	Performance against	Performance against metric
Alt. n	Performance against	Performance against	Performance against	Performance against

- **Combine measures to improve performance**
- **Screen poorly performing plans**

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Comparison of Plans / Measures



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Planning Unit Y

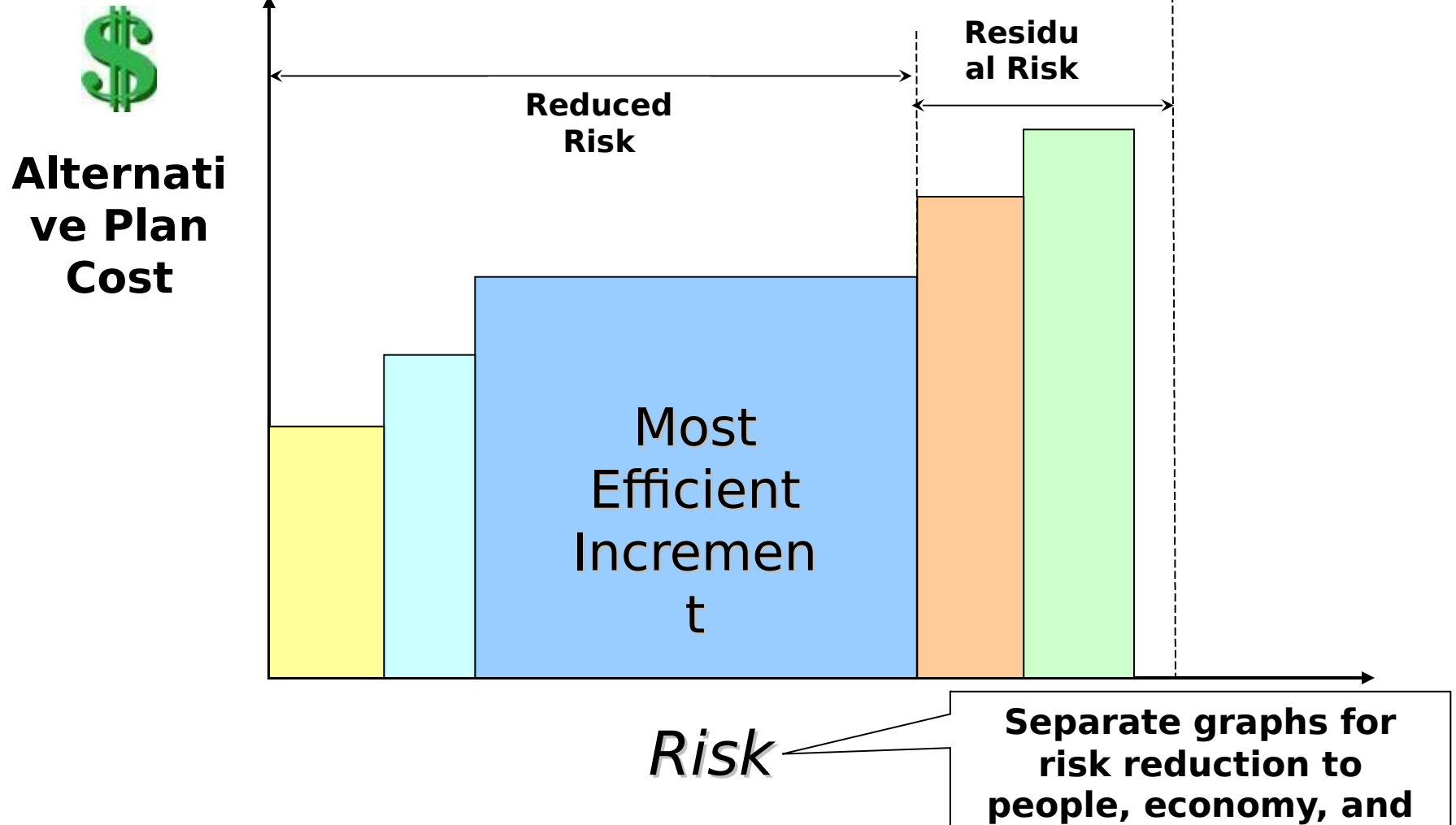
Scenario Metric	Scenario Combination 1	Scenario Combination 2	Scenario Combination 3
Metric 1	Alt. 1	Alt. 2	Alt. 3
Metric 2	Alt. 1	Alt. 2	Alt. 3
Metric 3	Alt. 1	Alt. 3	Alt. 4
Metric 4	Alt. 2	Alt. 3	Alt. 5
Metric n	Alt. 2	Alt. 4	Alt. 5

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Example Risk Display

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Communicating Risk



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- Maps showing areas with reduced risk under various scenario/plan combinations
- Maps showing areas remaining at risk under various scenario/plan combinations
- Comparisons with and without project for a given event such as a Katrina-like storm
- Content / format consistent with that provided by FEMA, USGS, NOAA

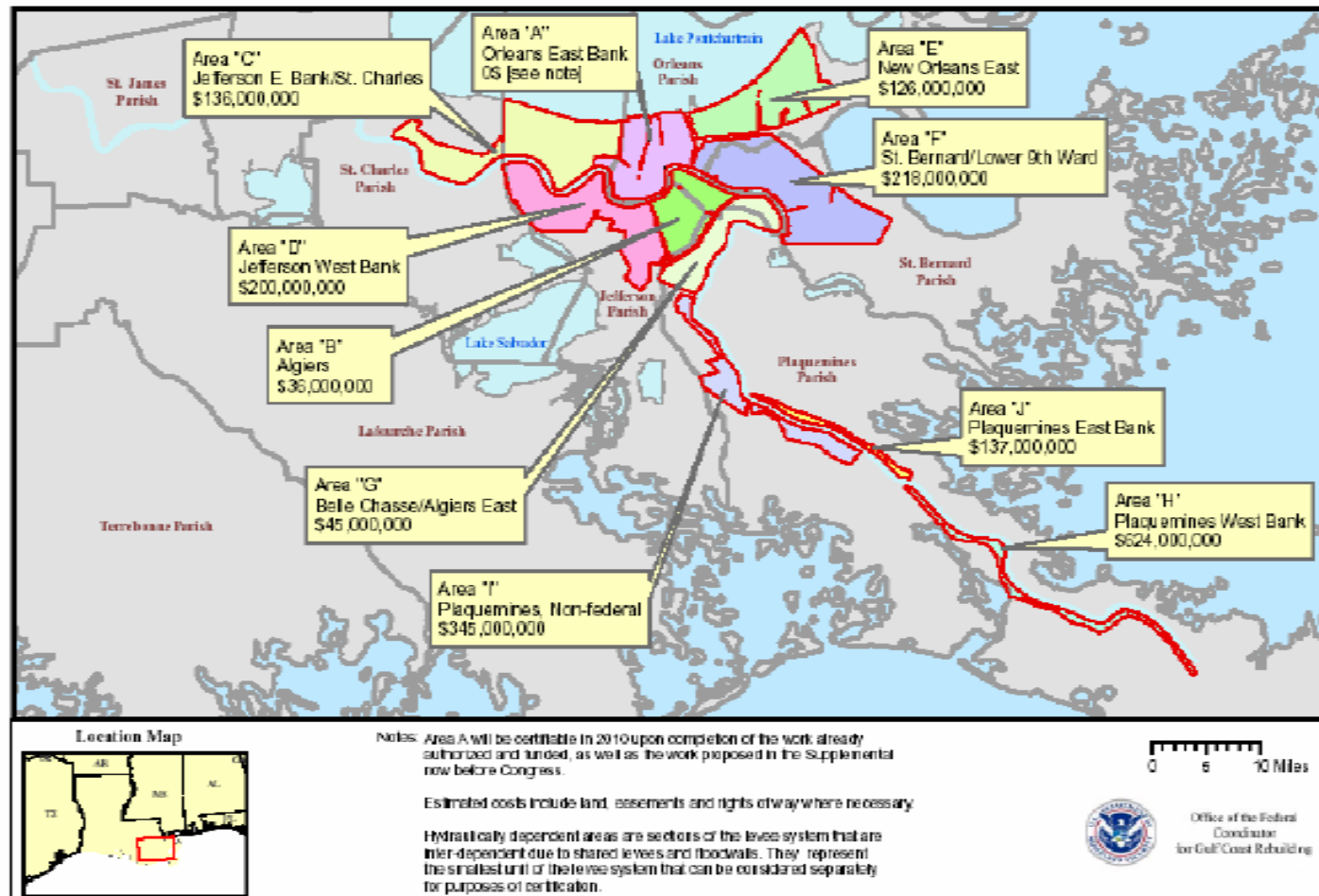


Example of Risk Communication



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Costs to Certify Levee Systems by Hydraulic Area



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Decision Making Criteria: Characteristics of a Desirable Plan



- Residual risk
- Robustness
- Reliability
- Adaptability
- Acceptability
- Timeliness
- Cost
- Certainty
- Sustainability
- Completeness
- Separability
- System Integration



Final Technical Report (FTR) Development Objectives / Major Milestones



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- Develop State Master Plan alternatives 7 AUG 06 – 15 NOV 06
- Develop Risk-Informed Planning Framework (RIP)
.....10 AUG 06 – 6 OCT 06
- Prepare RIP model and inputs for further
analyses.....10 AUG 06 – 15 NOV 06
- Identify high priority risk reduction/restoration
features through RIP.....15 NOV 06 – 31 JAN 07
- Conduct NEPA / continued planning on initially analyzed
alternatives.....1 FEB 07 – 1 OCT 07
- Develop FTR and Draft PEIS for upward
submittal.....15 NOV 06 – 1 OCT 07
- FTR and Final PEIS upward
submittal.....1 OCT 07 – 31 DEC 07



Questions / Issues for Discussion



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- What are views on rigor, effectiveness, and practicality to implement the RIP process as currently developed in timeframe required? Might there be valuable simplifications?
- What metrics and units would best quantify an objective to “sustain coastal Louisianaians living and working in wetlands who are producing regional and national economic outputs that cannot be achieved anywhere else in any other way”.
- Beyond planning, how do nations worldwide handle deeply conflicting but vitally important features, such as need to manage rivers and coasts for coastal restoration and protection while sustaining important navigation activities?
- How should adaptive management be implemented in RIP development and application for project planning, design, construction, operation, and maintenance, so that decision makers are comfortable with making the investment in the beginning?

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Additional Information



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Project Web Page



<http://lacpr.usace.army.mil/>